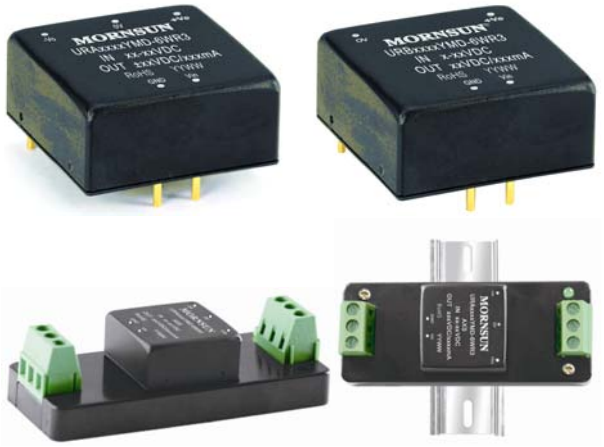
6W,Ultra wide input, isolated & regulated dual/single output, YMD package, DC-DC converter



FEATURES

- Wide range of input voltage (4:1)
- Efficiency up to 88%
- No-load power consumption as low as 0.2W
- Isolation voltage :1500VDC
- Operating temperature range: -40℃ to +85℃
- Input under-voltage protection, output over-voltage, over-current, short circuit protection
- Meet CISPR22/EN55022 CLASS A
- International standard pin-out
- A2S (wring mounting) and A4S (35mm rail mounting) products featuring anti-reverse connection for input

Patent Protection RoHS

URA_YMD-6WR3 & URB_YMD-6WR3 series products are of 6W output power, extremely wide range of voltage input of 9-36VDC, 18-75VDC, isolation voltage of 1500VDC, output over-voltage protection and output short circuit protection with the bare component in compliance with CISPR22/EN55022 CLASS A; these products are widely used in fields such as Medical care, industrial control, electric power, instruments and communication.

Selection Guide

Part No. ①	Input Voltage (VDC)		Output		Efficiency ③ (%,Min./Typ.) @ Full Load	Max. Capacitive Load ④ (μF)
	Nominal (Range)	Max. ②	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
URA2405YMD-6WR3	24 (9-36)	40	±5	±600/±30	81/83	470
URA2412YMD-6WR3			±12	±250/±12	85/87	100
URA2415YMD-6WR3			±15	±200/±10	86/88	100
URA2424YMD-6WR3			±24	±125/±6	86/88	100
URB2403YMD-6WR3			3.3	1500/75	77/79	1800
URB2405YMD-6WR3			5	1200/60	81/83	1000
URB2409YMD-6WR3			9	667/33	83/85	680
URB2412YMD-6WR3			12	500/25	85/87	470
URB2415YMD-6WR3			15	400/20	86/88	220
URB2424YMD-6WR3			24	250/13	86/88	100
URA4805YMD-6WR3	48 (18-75)	80	±5	±600/±30	81/83	470
URA4812YMD-6WR3			±12	±250/±12	85/87	100
URA4815YMD-6WR3			±15	±200/±10	86/88	100
URA4824YMD-6WR3			±24	±125/±6	86/88	100
URB4803YMD-6WR3			3.3	1500/75	77/79	1800
URB4805YMD-6WR3			5	1200/60	81/83	1000
URB4812YMD-6WR3			12	500/25	85/87	470
URB4815YMD-6WR3			15	400/20	86/88	220
URB4824YMD-6WR3			24	250/13	86/88	100

Notes:
① Part No. with suffix of "A2S" means chassis mounting and suffix of "A4S" means DIN-Rail mounting (e.g. URB2405YMD-6WR3A2S means chassis mounting; URB2405YMD-6WR3A4S means DIN-Rail mounting);
② Absolute maximum rating without damage on the converter, but it isn't recommended;
③ Efficiency is measured In nominal input voltage and rated output load;A2S (wiring) and A4S (rail) Model due to input reverse polarity protection, minimum efficiency greater than Min.-2 is qualified.
④ The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit

Input Current (full load / no-load)	24VDC input	--	316/5	--	mA
	48VDC input	--	160/4	--	
Reflected Ripple Current	24VDC input	--	20	--	
	48VDC input	--	20	--	
Input impulse Voltage (1sec. max.)	24VDC input	-0.7	--	50	VDC
	48VDC input	-0.7	--	100	
Starting Voltage	24VDC input	--	--	9	
	48VDC input	--	--	18	
under-voltage turn-off	24VDC input	5.5	6.5	--	
	48VDC input	14.0	15.5	--	
Input Filter		Pi filter			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			--	±1	±3	%
Balance of Output Voltage	Dual output, balanced load		--	±0.5	±1.5	
Line Voltage Regulation	Full load, the input voltage is from low voltage to high voltage		--	±0.2	±0.5	
Load Regulation	5%-100% load		--	±0.5	±1	
Cross Regulation	Dual output, main circuit with 50% load, auxiliary circuit with 10%-100% load		--	--	±5	
Transient Recovery Time	25% load step change		--	300	500	μs
Transient Response Deviation		3.3V, 5V, ±5V output	--	±5	±8	%
		Others	--	±3	±5	
Temperature Drift Coefficient	Full load		--	--	±0.03	%/℃
Ripple & Noise*	20MHz bandwidth		--	60	85	mV p-p
Output Over-voltage Protection	Input voltage range		110	--	160	%Vo
Output Over-current Protection			110	140	190	%Io
Output Short circuit Protection			Continuous, self-recovery			

Note:*Parallel line test method is adopted to test ripple and noise, please see *DC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	Derating if the temperature is ≥71℃ (see Fig. 1)	-40	--	85	℃
Storage Humidity	Without condensation	5	--	95	%
Storage Temperature		-55	--	125	℃
Max. Operating Temperature for Casing	Within the operating temperature curve	--	--	105	
Lead Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Switching Frequency *	PWM mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Note:* This series of products using reduced frequency technology, the switching frequency is test value of full load,When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

Physical Specifications

Casing Material	Aluminum alloy

Package Dimensions	Horizontal package	25.40*25.40*11.70 mm
	A2S chassis mounting	76.00*31.50*21.20 mm
	A4S DIN-rail mounting	76.00*31.50*25.80 mm
Weight	Horizontal package/A2S wiring package/A4S rail package	14g /36g /56g(Typ.)
Cooling method		Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-② for recommended circuit)	
	Radiated emission	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-② for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±4KV	perf. Criteria B
	Radiation immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge immunity	IEC/EN61000-4-5 ±2KV (see Fig.3-①for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29 0-70%	perf. Criteria B

Product Characteristic Curve

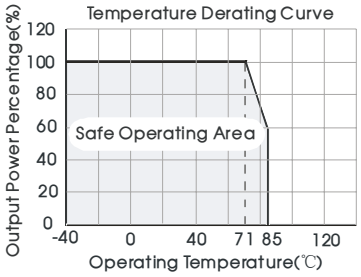
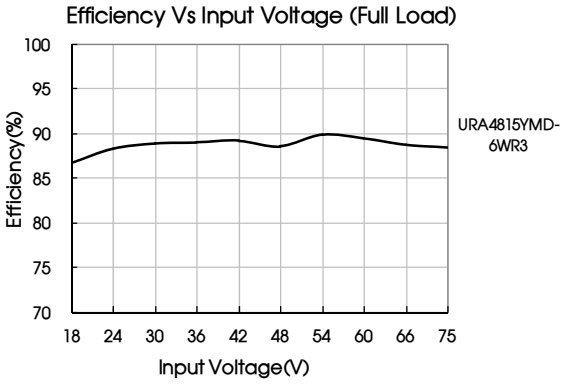
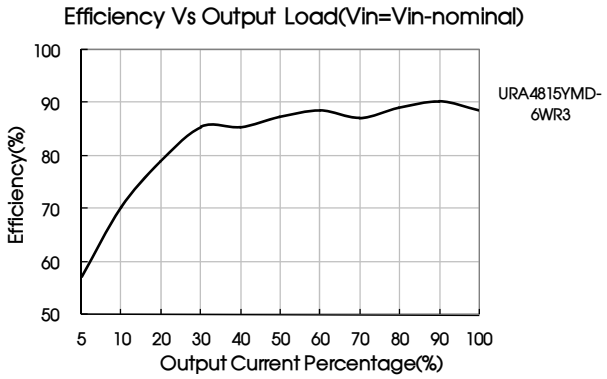
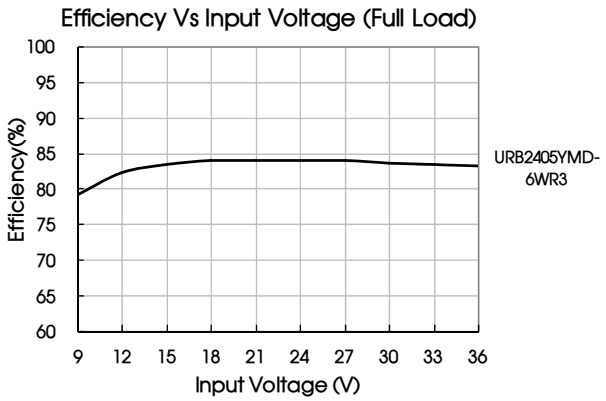
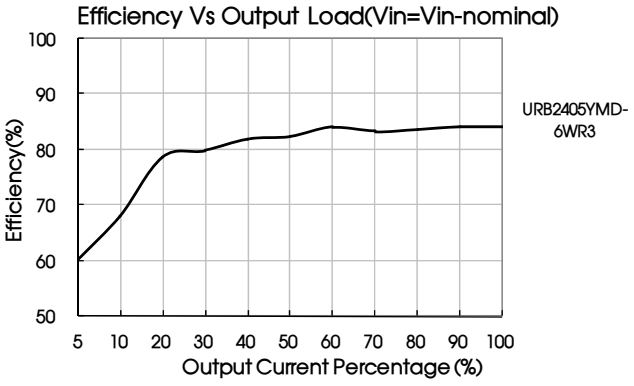


Fig. 1









Design Reference

1. Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

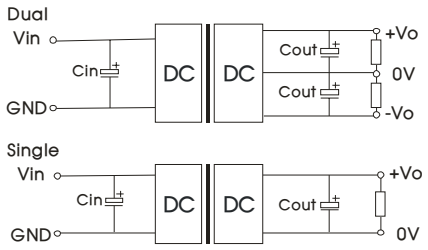


Fig. 2

Vin(VDC)	Cin(uF)	Cout(uF)
24	100	10
48	10~47	10

2. EMC solution-recommended circuit

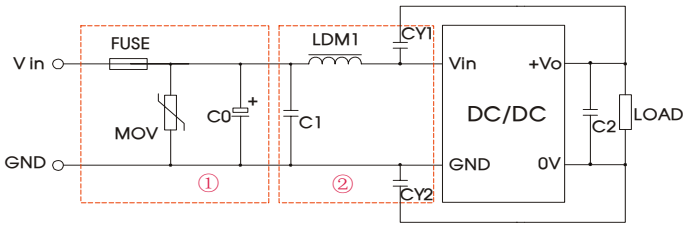


Fig. 3

Notes: Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.

Parameter description

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	S14K35	S14K60
C0	330μF/50V	330μF/100V
C1	1μF/50V	1μF/100V
C2	Refer to the Cout in Fig.2	
LDM1	4.7μH	
CY1, CY2	1nF/2KV	

EMC solution-recommended circuit PCB layout

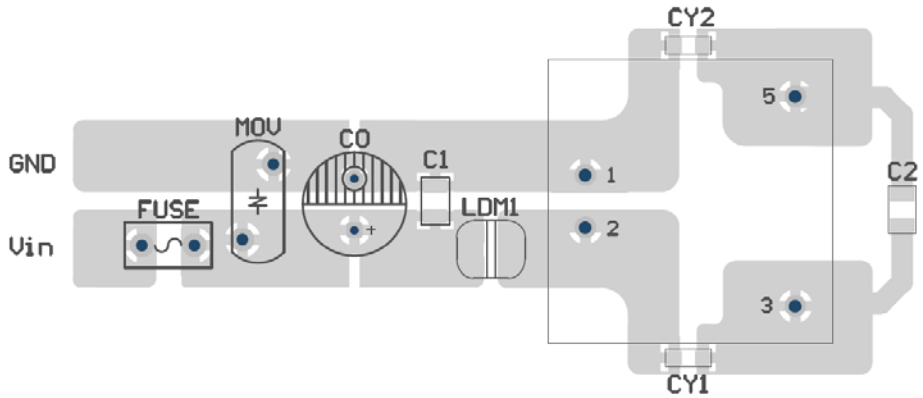


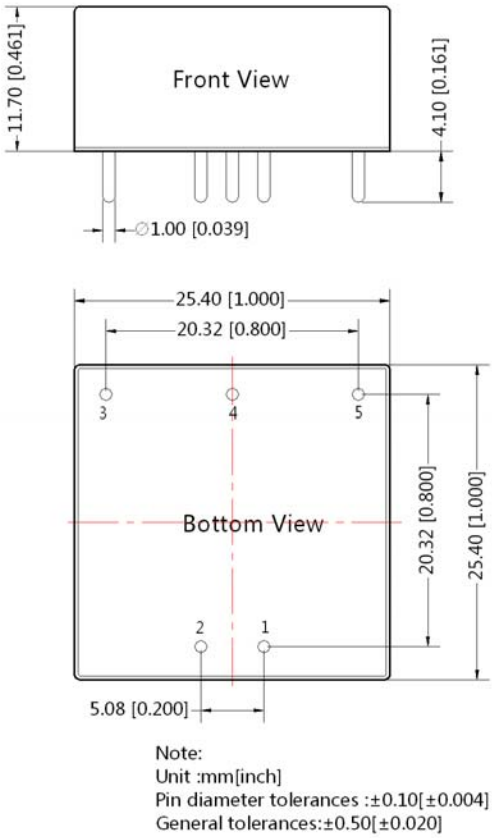
Fig. 4

Note: the min. distance of the bonding pads between input & output isolation capacitors (CY1/CY2) shall be ⩾ 2mm.

3. The product does not support output in parallel with power per liter or hot-plug use

4. For more information please find the application note on www.mornsun-power.com

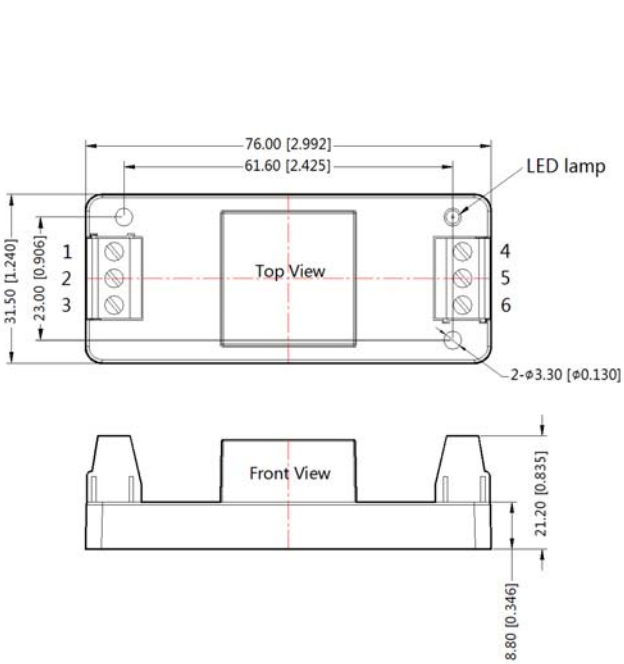
Dimensions and Recommended Layout



Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo

Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

URA_YMD-6WR3A2S & URB_YMD-6WR3A2S Dimensions

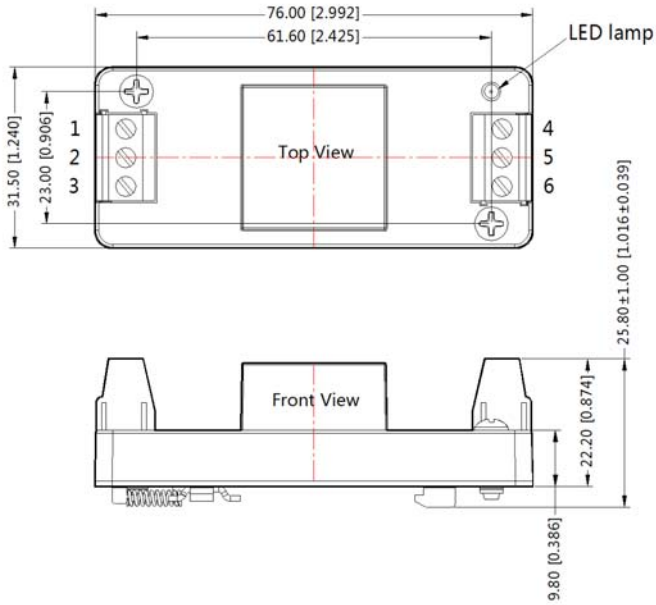


Pin-Out						
Pin	1	2	3	4	5	6
Dual	NC	GND	Vin	-Vo	0V	+Vo
Single	NC	GND	Vin	0V	NC	+Vo

Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±0.50[±0.020]

URA_YMD-6WR3A4S & URB_YMD-6WR3A4S Dimensions

THIRD ANGLE PROJECTION



Pin-Out						
Pin	1	2	3	4	5	6
Dual	NC	GND	Vin	-Vo	0V	+Vo
Single	NC	GND	Vin	0V	NC	+Vo

Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±0.50[±0.020]

Note:
1. Packing Information please refer to 'Product Packing Information'. Packing bag number : 58210003(DIP),58220022(A2S/A4S package);
2. Recommended used in more than 5% load, if the load is lower than 5%, then the ripple index of the product may exceed the specification, but does not affect the reliability of the product.
3. The unbalance degree of the recommended dual output module load: ⩽ 5%; if the degree exceeds ±5%, then the product performances cannot be guaranteed to comply with all the performance indicators in the manual, and please directly contact our technicians for specific information;
4. The max. capacitive load should be tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load;
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
8. We can provide product customization service;
9. Specifications of this product are subject to changes without prior notice.

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